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ABSTRACT

Both humanity and nature have suffered greatly from human insensitivity. Not only are the natural resources of the earth being depleted and its air, land and water polluted, the financial resources of humanity are being wasted on destructive expenditures. The "Our Only Earth" series is an integrated science, language arts, and social studies problem solving program for grades 4-12 that addresses six different global issues. The units are designed to provide students with knowledge and skills to address these major global issues actively. The unit presented in this document addresses the problems associated with the pollution and protection of the earth's marine resources. This document includes information to assist teachers in organizing and directing students in their activities. This teacher's guide includes a unit overview, instructions on how to collect information through letter writing (including addresses for appropriate organizations), three classroom activities, a set of fact cards, instructions for a scavenger hunt, instructions for a geography activity, instructions for research and independent study, and materials for a youth summit on the oceans. Additional materials included in this packet are a discussion and chart of instructional techniques and thinking skills used in the unit, a glossary of terms and a bibliography of 44 books, articles, other resources, and games on oceans issues. (CW)

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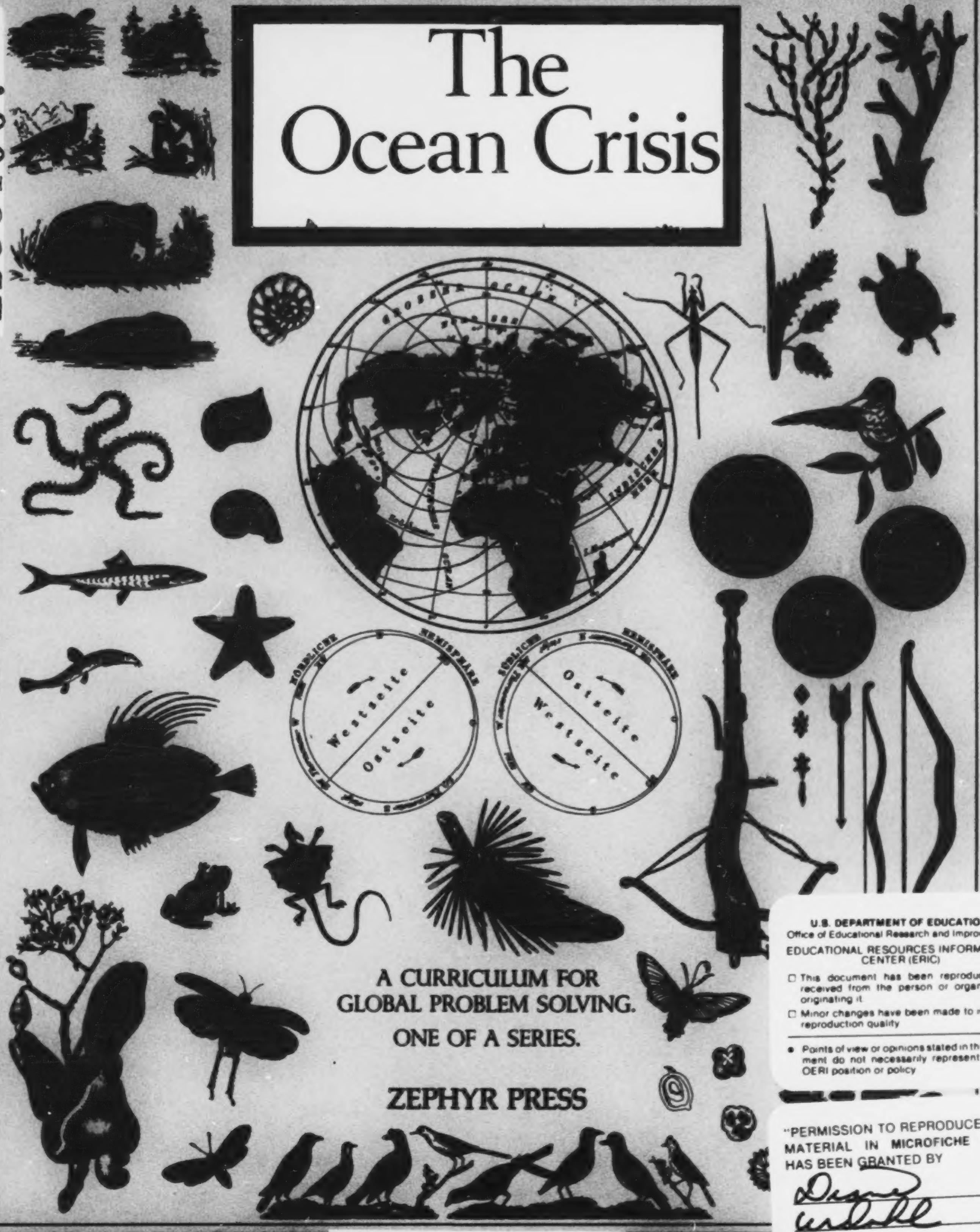
The Ocean Crisis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A CURRICULUM FOR GLOBAL PROBLEM SOLVING.

ONE OF A SERIES.

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OUR ONLY EARTH SERIES

A CURRICULUM FOR GLOBAL PROBLEM SOLVING

The Ocean Crisis

An integrated curriculum that explores real life issues, culminating with a SUMMIT where students seek solutions to global problems and create action plans. This versatile program is ideal for grades 4th–12th, or as a format for community and regional forums.

Our Troubled Skies
The Future of Our Tropical Rainforests
Our Divided World: Poverty, Hunger & Overpopulation
War: The Global Battlefield
Endangered Species: Their Struggle to Survive
The Ocean Crisis

By LINDA MacRAE-CAMPBELL, MICKI McKISSON and BRUCE CAMPBELL

OUR ONLY EARTH

A CURRICULUM FOR GLOBAL PROBLEM SOLVING

The Ocean Crisis

- One in a Series of Six Non-Sequential Units
- For Grades 4-12 • Small or Large Groups
- One Month to One Year Course of Study
- Each Unit Follows the Same Format

Our Troubled Skies
The Future of Our Tropical Rainforests
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Zephyr Press • Tucson, Arizona

By LINDA MacRAE-CAMPBELL, MICKI McKISSON and BRUCE CAMPBELL

**Dedicated to Our Common Mother—
Our Beloved and Only Earth**

"...The earth does not belong to man: man belongs to the earth. This we know: all things are connected. Whatever befalls the earth, befalls the sons of the earth. Man did not weave the web of life. He is merely a strand in it. Whatever he does to the web, he does to himself."

Chief Noah Sealth, 1854

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We especially appreciate the support and encouragement of our families and friends throughout the creation of these materials. We also want to acknowledge the efforts of people around the world who are seeking ways to appropriately care for humanity and for our only Earth.

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Our Only Earth Series

The Chinese ideograph for the word *crisis* is made up of two words: danger and opportunity. Currently, there are many threatening global issues and diverse opinions as to how to address them. For example, Noel Brown, director of the United Nations Environmental Program, urges immediate action, stating that the earth has approximately 4000 days before it is irreparably polluted. Another view, held by physicist and author F. David Peat, states that individuals need to learn to think systemically and reflectively before taking action.

It should be noted that the intent of the *Our Only Earth* materials is to provide students with knowledge and skills to actively address major global issues. We feel that exciting opportunities exist for resolving pressing social and environmental problems when students are educated about real-life issues, have the tools to address them, and have the desire to act to improve the lives of others and the health of the planet.

Humanity and the environment have suffered greatly from our own insensitivity. To insure our survival and the survival of all forms of life, it is necessary to establish an ethical relationship with others and the planet we share.

Our Only Earth is an integrated science, language arts, and social studies problem-solving program consisting of eight classroom activities. Each of the units in the series follows the same format. These activities can extend from one month of study to an on-going year-long process. Students enthusiastically embrace the lessons because the instructional strategies are so varied and appeal to learners of all ages and types.

Students enjoy the *Our Only Earth* series also because real-life issues are addressed and solutions proposed. This program provides information which is aimed at strengthening students' skills, enabling them to contribute positively to their world.

Introduction

Both humanity and Mother Earth have suffered greatly from human insensitivity. Not only are we rapidly depleting the planet's resources and polluting its air, land, and water, we also waste our financial resources on destructive expenditures. Current global trends reveal the unhealthiness of our planet and our priorities:

- According to Dr. Norman Myers, one species a day is becoming extinct. This rate is expected to accelerate to one species every 15 minutes by the year 2000.

- Myers also states that every year 40 million people die from starvation and hunger-related diseases, half of them children. This is equivalent to more than 300 jumbo jet crashes every day.

- Tropical rain forests comprise only 8% of the earth's surface but contain 40% to 50% of all known species of life. Tropical forests play an important role in regulating global climate and provide an abundance of resources to all of humanity. Yet, according to Walter Corson, if present trends continue, most of the world's tropical forests will be gone by the year 2000.

- Scientists predict that various forms of air pollution may cause global temperatures to rise, the oceans to expand and flood coastal lowlands, interrupting natural food chains, and cause widespread skin cancer among humans.

- According to Lester Brown, in 1988 the world spent more than $100 million each hour on global military expenditures.

- A 1988 article in *Nature Scope* explains that every year fourteen billion pounds of trash are dumped into the oceans. Oil spills, industrial waste, agricultural chemicals, and human pollution relentlessly choke our oceans and marine life.

These statistics are frightening and depressing. When we first began to develop this global education program, we were shocked at the dilapidating state of our planet. We grew apprehensive over the increasing potential for devastation were these problems allowed to escalate. All in all, the prospects seemed dim. Yet, in watching students tackle these monumental global issues—overwhelming to us—our hope was restored. Students, fourth through twelfth grade, once acquainted with this program, developed solid action plans addressing the major global challenges of today.

A few of the students' recent solutions include:

- creating an Animal Congress for animal rights.
- drafting the *Youth Declaration for the Future* which requests that governmental priority be given to global issues
- writing letters protesting deforestation
- adopting a humpback whale
- developing church, school, and community forums
- writing letters to newspapers about global concerns
- picking up litter at parks and beaches

Our fears were quelled by hope as students grew confident in their ability to make a difference in their world, for their world. A seventh grade girl named Emma Wilson stated:

> *"These problems have been left to us. We are the ones who will make a difference. We are the future and we do care."*

Your students will also gain knowledge about a particular area of global concern; they will learn a problem-solving process that addresses an issue of great magnitude and ideally, they will be roused to action. The legacy of a polluted environment with crippling social problems will be inherited by our students, who, with help from the *Our Only Earth* series, will gain the knowledge, skills, and hopefully, the desire to appropriately care for our Earth. All kingdoms of life will benefit.

Note: Sources for the facts mentioned on the previous page can be found in the bibliography.

Various Instructional Techniques

Not only are the global topics timely and important, but they will incite enthusiasm in your students. The activities, developed by award-winning teachers and field-tested by elementary and secondary students, are first and foremost FUN! Students will enjoy the dynamic and varied learning activities. You, as the instructor, will appreciate the care and thoroughness that went into the preparation of these lessons for use in your classroom.

A variety of instructional strategies are used in classroom activities in order to appeal to all types of learners. Several concrete and experiential learning processes engage the bodies, minds, and feelings of students. Kinesthetic, visual, and auditory functions are stimulated to maximize the learning potential of each student. The lessons provide opportunities for them to work independently as well as cooperatively in small and large groups. Critical and creative thinking skills are incorporated into the activities to engage students in higher levels of thinking. A creative problem-solving stategy is implemented to help students approach the issues at hand. The chart on the following page depicts the variety of instructional strategies and higher level thinking skills which are included in *Our Only Earth* activities.

INSTRUCTIONAL STRATEGIES & THINKING SKILLS IN *OUR ONLY EARTH*

	Overview	Letter Writing	Classroom Activities	Accelerated, Cooperative Learning: Nothing but the Facts	Scavenger Hunt	Where in the World Map Activity	Self-Directed Learning	Global Problem Solving: The Summit
Learning-to-Learn Skills	X	X			X	X	X	X
Memory Skills	X			X				X
Kinesthetic Activites			X	X	X		X	X
Visual Activities	X		X	X	X	X	X	X
Creative Thinking Skills	X		X	X	X		X	X
Critical Thinking Skills	X	X	X	X	X	X	X	X
Problem Solving		X		X	X	X	X	X
Cooperative Learning	X			X	X	X		X
Research Skills	X	X	X	X	X	X	X	X
Communication Skills	X	X		X	X	X	X	X
Engaging Feelings	X		X					X

In addition to a variety of instructional strategies, the enclosed lessons also provide an integrated learning experience which incorporates science, language arts, social studies, and thinking skills. The following chart shows the integration between subject matter and lessons and activities of *Our Only Earth:*

- SCIENCE
  - Overview
  - Classroom Activities
  - Fact Cards
  - Scavenger Hunt
  - Research
- LANGUAGE ARTS
  - Overview
  - Letter Writing
  - Scavenger Hunt
  - Research
  - Independent Study Contract
- SOCIAL STUDIES
  - Overview
  - Classroom Activities
  - Fact Cards
  - Scavenger Hunt
  - Research
  - Map Activity
- THINKING SKILLS
  - Overview
  - Scavenger Hunt
  - Research
  - Youth Summit—all processes

The Sequence of Our Only Earth

Our Only Earth has been carefully structured for both the student and the teacher. Study of the global problem begins with a brief survey, followed by in-depth information and independent research, culminating with a problem-solving process where students conduct their own Youth Summit. At the Summit, the students search for solutions and create action plans to approach the global issues.

In the Teacher's Guide, you'll note explanations for each student activity. The lessons in *Our Only Earth* are intended to be used as guidelines. Your creativity is encouraged, so please use these materials as a springboard for developing your own classroom activities.

The Overview

The students begin with an Overview of the issue. The Overview serves as a quick appraisal of the global issue and discloses important facts as to WHY this topic is worthy of study. Since the Overview shares poignant information, the students often become emotionally engaged in the topic. If students feel overwhelmed or fearful, as we initially did, reinforce the point of studying this issue—to improve environmental or social conditions. To do this, it is necessary to be informed.

Letter Writing

Next, students will write letters to organizations requesting information about the particular global problem at hand. This activity serves two main purposes: to introduce students to formal letter writing, and to provide them with up-to-date information on the topic.

Classroom Activities

Students, as a class, will then have hands-on experience to personally explore aspects of the global issue. Because of the experiential nature of these activities, the students should be motivated to study further for the next activity.

Nothing But The Facts!

This is a cooperative and accelerated learning activity that teaches facts and information about global problems. Students are divided into small groups. Everyone receives a fact card and teaches the three facts on the card to their group. Next, the group prepares a dynamic mini-presentation to teach their facts to the whole class. When this lesson is complete, the students will have learned a wealth of information about their global challenge.

Scavenger Hunt

Prepare for your students to go wild with excitement over this activity! The students will be gathering additional information on their topic through a scavenger hunt method. Again, the students will work in small groups and then share the data they have gathered with the whole class.

Where In The World.........?

This is an enjoyable map activity. Students locate acute problem spots on a world map, pinpoint the coordinates, and identify the regional areas involved.

Research and Independent Study Contract

Now that your students have gathered an abundance of information, they are ready to identify one aspect of the problem and pursue it through independent research. To help facilitate this individualized research, each student will complete a contract. You will then be able to log each student's progress, as well as help your class move towards the most valuable type of educational experience—self-directed learning.

The Youth Summit

Here the students will actively meet in groups to share what they have learned, to decide upon a specific problem they want to solve, and to create a plan of action. This problem-solving process is the highlight of the entire unit. At the Summit, students are asked to make positive contributions to the world. Activating the students' plans may, for some, take a short period of time, or in other cases, depending on the particular commitment, may take longer.

As your students progress through *Our Only Earth*, you will undoubtedly notice many significant attitude changes. They grow aware of the delicate global environment we live in. They develop a sense of responsibility towards others. Often there is a commitment to become a caretaker for the planet. Here is what some students have to say after participating in *Our Only Earth* Programs:

"We are the ones doing this to ourselves and we can learn to stop."
Sue Ann Martin, age 11

"I learned that I am not the only one out there who cares and that I have something to do for this polluted but wonderful world."
Misty Vichitnand, age 12

"After studying these problems, I learned to be more caring for the world. I see that we can be world changers."
Jason Schmidt, age 9

Note: As you photocopy activities for your students, remember that copier paper can be recycled too!

1 The Overview

Suggested Activities for the Global Issue Overview

(approximate time: 1 hour)

The Overview contains interesting information on your global challenge and will ready students for more in-depth information. The intent of the Overview is to provide your class with a quick survey of the main issues while piquing their curiosity and their desire to learn more.

One way to introduce students to the Overview is to first have them quickly brainstorm what they already know about the topic. They can do this individually or as a group. You may want to list or chart their information on the blackboard. Another option would be to list the information on an overhead sheet or on a piece of butcher paper so that students can refer back to their original suggestions and then add new information when needed.

Copies of the Overview are distributed after the discussion. Suggest your class read silently through the material once to pick up general information. For the second reading, have students note at least three facts that are particularly interesting to them. Ask the students to prepare to teach these three facts to a small group of students or to the whole class. Suggest they make visuals, a riddle, or a short poem to help teach the others. Give the students about fifteen minutes to prepare.

After the students have shared their three facts, ask the class for additional questions they might have about the global issue. You may want to suggest they consider questions asking **who, what, where, when, why and how.** As the students begin to share their questions, you may want to list them on the board or on a piece of butcher paper for future reference. Later, as the students progress through their studies, they may want to note answers they have found to their questions.

Overview of the Ocean Crisis

Oceans cover nearly three-fourths of the Earth's surface. Ours is actually a planet of oceans. There are three major oceans and several smaller seas, bays, and other connected bodies of waters. However, there is really only one world ocean because the individual ones all interconnect.

All life began in the oceans. The very first single-celled organisms which developed millions of years ago were very similar to ones still living in our oceans today. But over millions of years many other forms of marine life developed as well. There are thousands of varieties of fish, shellfish, marine mammals, such as whales, dolphins, and seals, plants, such as seaweeds and algae, and a host of other living things. The ocean is filled with life, but today much of that life is in danger.

Life on land is dependent upon life in the oceans. We depend on the oceans for much of our food. Some scientists predict that in the future we will look to the oceans as an even greater source of food. Minerals are mined from the seas. In some places, ocean water is desalinated for drinking and irrigation. The oceans are a highway of commerce and communication for trading ships, passenger ships, and recreational boats traveling the world. The oceans are a source of scientific exploration and discovery. Also, humanity has used the oceans as a dumping ground for sewage, garbage, oil, industrial waste, agricultural runoff, incineration, radioactive byproducts, and discarded fishing nets, plastics, and general trash. The oceans, the womb of life, are now damaged by human activities.

Protection of our oceans and coastlines is a fundamental concern at this time because they are so seriously polluted. Some of the activities that have been harmful to oceans and marine life include the following:

- Commercial fishing fleets rapidly deplete populations of many species of fish for human consumption without a thought to restocking. At the same time, their nets catch marine mammals and other fish which perish and are thrown back into the water.

- Toxic chemicals from industry and agriculture find their way into coastal waters from runoff, acid rain, and straight dumping. This waste kills shoreline plants, contaminates edible fish, and destroys the ecological balance of the shallow, sensitive shorelines.

- Oil tankers spill huge amounts of oil into the oceans, sometimes accidentally, but most often intentionally, as they flush thousands of gallons of oil into the seas to clean their tanks.

- Offshore oil drilling and mining damage the shorelines in ever increasing amounts.

- Whales, dolphins, and sea turtles are slaughtered for human use. Many species are now officially endangered.

- Incineration, the burning of waste at sea, puts extremely hazardous toxins into the ocean which deform, contaminate, and kill many species of marine life.

Unfortunately, the list goes on. Humanity is the cause of too many of the oceans' problems.

For that reason, we must come to the rescue. The oceans are capable of cleansing themselves, but only up to a point. However, that point has been reached and passed. Every nation in the world must be educated about the dangers threatening our oceans. Global action must be taken to seek and implement solutions to ocean pollution and other problems. Humanity is the cause of these problems but humanity can also be the solution. By learning more about the ocean crisis, you can play an important role in helping save our oceans and the millions of plants and animals living in them. In order for our lives to continue in a healthy way on this planet we need healthy oceans.

2 Letter Writing

Writing to Organizations for Information

(approximate time: 1 hour)

In order to gather current information on the global challenge, you will want to initiate a letter-writing activity to various organizations at the beginning of the unit. It often takes four to six weeks to receive information. However, the wait is well worth it, as the materials will provide relevant and up-to-date information. For a quicker response, depending upon your locality, you can also call organizations and ask them to send information.

To introduce this letter-writing activity, ask the class to consider questions they have about the issue at hand. Explain that writing letters to public and private organizations is an effective way of gathering information on a topic where data is continually changing.

Begin by providing students with copies of "Organizations to Write to for Information." Brainstorm with them about what elements to include in a letter that requests information. Assign groups, pairs, or individual students to contact an organization. You may want to suggest that they create an outline before writing. It's important for students to be specific in their requests for materials. Depending upon the age and ability level of your students, you may wish to format a sample letter.

Expect an abundance of information from these organizations.

Organizations to Write to for Information on the Ocean Crisis

AMERICAN CETACEAN SOCIETY
P.O. Box 2639
San Pedro, CA 90731
(213) 548-6279

COUNCIL ON OCEAN LAW
1709 New York Avenue, N.W., 7th Fl.
Washington, DC 20006
(202) 347-3766

DEFENDERS OF WILDLIFE
1244 19th Street, N.W.
Washington, DC 20036
(202) 659-9510

GLOBAL TOMORROW COALITION
1325 G Street, N.W., Suite 915
Washington, DC 20005-3104
(202) 628-4016

NATIONAL WILDLIFE FEDERATION
1400 16th Street, N.W.
Washington, DC 20036-2266
(202) 797-6800

OCEANIC ALLIANCE
Fort Mason Center, Building E
San Francisco, CA 94123
(415) 441-5970

OCEANIC SOCIETY
218 D Street, S.E.
Washington, DC 20003
(202) 544-2600

POPULATION-ENVIRONMENT BALANCE
1325 G Street, N.W., Suite 1003
Washington, DC 20005
(202) 879-3000

WORLD RESOURCES INSTITUTE
1709 New York Avenue, N.W., Suite 700
Washington, DC 20006
(202) 638-6300

Note: Because these organizations may move before our annual Spring update, please see the *Encyclopedia of Associations* for the most current addresses.

3 Classroom Activities:

Understanding the Ocean Crisis

In order to help students better understand ocean problems, you may want to do one or more of the following activities with your class:

1. A Miniature Oil Spill

Materials Needed:

- 1 plastic tub
- about one-half cup of used motor oil
- various absorbant materials
- choice of liquid storage containers

The purpose of this activity is to acquaint students with the complexities of cleaning up an oil spill. Begin by having them examine the clean water, comment upon its appearance and its possible uses (drinking, washing, cooking, etc.). Next show them the oil. Any oil can be used. Old motor oil is dramatic because of its dirty appearance and it is easiest to see. However, even cooking oil can be used because any oil will float and spread out to cover the surface of a container of water. (In fact, oil spilled on water can theoretically spread out until it is only one molecule thick. Because of ocean currents, wind, and land formations, it is usually thwarted, but one large oil spill could cover millions of square miles.)

After "spilling" the oil into the water, the students are to determine how to clean the water of the oil. In addition to this activity, the students can write to different organizations such as the EPA, the U.S. Coast Guard, or major oil companies, Exxon, to find out how such clean-up is actually conducted.

Finally, the students must determine how they will dispose of their "experiment." They now have polluted water which would not be wise to pour down the drain. Can it be dumped outside? Should it be put in a container? Some phone calls to local environmental organizations or county or state officials will lead to a solution.

2. The Oceans Game

Materials Needed:

- Tagboard
- rulers
- brads
- markers
- world map or globe

The purposes of creating this board game are to learn about the location and names of the world's oceans and to find out what some of the problems are and where they exist. Students should begin by making a "rough draft" of their game so that the final copy on tagboard will not require erasures.

To start, have students draw a winding path through the oceans on a world map. The path should be divided into one inch sections along which the players will move. Playing pieces can be "boats" (beans, pennies, etc.) which follow the path through the world's oceans. Along the way, the players can meet obstacles (floating drift nets, an oil slick, floating garbage) which cause them to lose a turn, go back 5 spaces and so on. Or they can run into helpers (clean-up crews, environmental scientists, recycling organizations) which cause them to gain extra points, draw a good luck card, take an extra turn, and so forth.

Play can progress by shaking dice, drawing cards (student made), or a spinner. A spinner can be built right onto the game board with a cardboard arrow and a brad. All sorts of cards can be used such as the Chance or Community Chest type of cards found in the game Monopoly.

The winner can be the first one to get around the board, the first one to get one hundred (100) clean-up the environment chips or points, the first one to accomplish five tasks, such as cleaning up an oil-spill, saving a whale, etc. Let the students make the game. One suggestion: usually the simpler the games are, the better they work.

3. Global Ocean Conference Simulation

The object of this simulation is to familiarize students with issues related to the ocean crisis. Because the world's oceans are "unowned," international waters, there is little regulating or monitoring of this massive area. By role playing representatives of different countries and different special interest groups, the students will gain a valuable perspective needed to resolve many ocean problems. In the process, they will also address many of the important problems and issues related to the crisis.

Begin by creating a scenario: the world's oceans are becoming polluted, their inhabitants (fish, mammals, plants, etc.) are endangered and dying, ocean resources are rapidly diminishing, and not enough is being done to reverse these problems. A global conference has been called with representatives from many nations and other interest groups to address the problems. The students will participate in this conference because a representative of each nation or group has been summoned . . . .

Depending upon the number of students and their ages, the teacher can create a global ocean conference tailored to each classroom. The teacher may want to limit the participants only to major polluting nations (U.S., Soviet Union, Japan, Brazil, etc.) although nearly every nation in the world contributes to ocean pollution in some way.

The teacher may want to add environmental groups, such as Greenpeace, which are active in stopping ocean problems. The teacher may also decide to send representatives from the ocean itself: a whale or dolphin to represent the mammals, a shark to represent the fish, a representative from the seaweed family or the coral family, or just one participant for all the ocean populations.

The structure of the conference is to be determined by each teacher. It could be an open forum where everyone can speak. There may be one representative from each country who goes back and forth between his group (for advice) and the summit table. It could take place in one period or reconvene over a period of days. They could address specific ocean problems (drift nets, oil spills, incineration, dumping) or focus on policies and strategies for regulation and control of the oceans in general (setting up an international ocean government, having different countries oversee different areas of the ocean, etc.)

Some specific questions that can be addressed are:
Should driftnets be legal?
How far should each nation's jurisdiction in the ocean extend?
Who should monitor international waters?
Should dumping or incineration be allowed in international waters?
Should killing of whales be legal?
Who should have fishing rights in the oceans?

Students should set goals, create practical strategies, and inform others about their Global Ocean Conference and its results.

4 Fact Cards

Cooperative Learning With Fact Cards

On the following pages you will find fact cards about your global issue. What follows is a description of a cooperative learning activity that will, in one or two hours, introduce your students to a number of facts. Not only will the students cooperatively learn from each other, they will be exposed to a vast amount of material from this activity.

You will note that there are four categories of fact cards, each category with a total of eight cards, 32 in all. Divide your class into four groups of approximately eight students in each, or if you'd rather, divide them into approximately eight groups of four students each. Each group is then assigned one of the four categories to study.

After the categories are assigned and the student groups are physically arranged, each group then receives cards from one of the four categories. Each student takes one card which contains three facts. Students are then responsible for completing the following activities:

- Read the three facts on the cards. (approx. 5 minutes)
- Teach group members their three facts. (approx. 5-10 minutes)
- Learn the facts from the other group members. (approx. 5-10 minutes)
- Decide, as a group, on 8-14 facts to teach the rest of the class by preparing a class presentation. (approx. 20-30 minutes)
- Teach the group's facts to the other groups in the classroom so that all may learn from each other. (approx. 30-60 minutes)

When the students are teaching their facts to their own group and then to the rest of the class, they should be encouraged to be creative and interesting in their instruction. Inform the students that they can teach with the following methods:

- visuals, charts, diagrams
- poems, songs, or stories
- role play, games, or skits
- question-and-answer or riddle formats
- charades
- invent their own creative teaching strategies

Suggest to the students that they teach in ways that enable others to really learn the information, not just listen and forget!

When students are placed into their groups, some may wish to study another category. You can explain that when the activity is completed, everyone in the class will have learned about ALL of the topics. So even if they don't have their first choice, they will still have an opportunity to learn what interests them.

Age and Class Size Adjustment

It is easy to adjust the fact-card activity to fit a variety of age groups as well as a larger or smaller number of students. For fourth- through sixth-grade students, you may want to have them learn only one or two facts per card, then each group could teach fewer facts to the entire class. If you have fewer than 32 students, ask for volunteers who are willing to learn more than one card.

Evaluation of the Activity

Evaluation can occur in a variety of ways throughout this activity. Observing how students teach one another will indicate what was learned individually. Having the students list, draw, or reenact what they gleaned from their classmates will also demonstrate their knowledge. At the end of the presentations, you may want to ask students to list on paper at least ten facts they have learned.

Nothing but the Facts

OCEAN POLLUTION
GENERAL INFORMATION:

1. Almost three fourths of the earth's surface is covered by oceans. Even though the oceans have different names, all of them are connected, forming one world ocean. They all meet around Antarctica.

2. The three great oceans of the world in order of size are: the Pacific Ocean, the Atlantic Ocean, and the Indian Ocean.

3. Each ocean contains smaller bodies of water which are called seas, bays, and gulfs. The Mediterranean Sea, the Caribbean Sea, and the North Sea are some of the largest seas. The Gulf of Mexico is one of the largest gulfs. San Francisco Bay is one example of a large bay.

OCEAN POLLUTION
GENERAL INFORMATION:

1. The oceans are where life began. The first organisms to exist were single-celled algae and bacteria very much like those that live in the oceans today.

2. The oceans are just as diverse as the land. There are millions of varieties of plants and animals and many different marine habitats. The oceans also contain many natural resources useful to man, including food, minerals, and energy.

3. If the icecaps around Antarctica and Greenland should melt, the oceans of the world would rise about 200 feet. This would put New York City under water with only the tops of the tallest buildings above water.

OCEAN POLLUTION GENERAL INFORMATION:

1. The coastal fringes of the world's oceans contain the greatest variety of plants and animals and are also the most delicate zones in the ocean.

2. These shallow coastal waters are the natural habitats for many shore birds and marine mammals such as seals and otters.

3. Man depends upon the rich coastal fishing grounds for the harvest of fish, shellfish and crustaceans. Most of our fish farms are also along the coasts.

OCEAN POLLUTION GENERAL INFORMATION:

1. For the past 150 years man has been producing artificial chemicals which are new to the earth. Today industrial countries produce more than 70,000 chemicals.

2. Many of these new chemicals are unlike anything in nature and they do not break down in water.

3. These chemicals often end up in the oceans and some are very toxic or poisonous to marine animals and plants.

OCEAN POLLUTION GENERAL INFORMATION:

1. Human activities from growing cities, industry, and agriculture pose major threats to our oceans. At least 83% of all marine pollution comes from land-based, human activities.

2. The oceans have become a dumping ground for many of the pollutants being produced. Research shows that no marine mammal anywhere in the world is free of toxic pollutants.

3. Polychlorinated biphenyls (PCBs), DDT (a pesticide), and dioxins are manmade, industrial chemicals that have spread throughout the world's oceans.

OCEAN POLLUTION GENERAL INFORMATION:

1. The chemicals which are harmful to the oceans are mostly used in industry. They are used for such things as fuel, plastics, bleaches and solvents. These industrial wastes are toxic and stay in the environment for a long time.

2. Many of the harmful chemicals are used in agriculture as fertilizers, pesticides, insecticides and fungicides.

3. Another source of ocean pollution caused by humans is the production and disposal of heavy metals like lead, mercury, copper, and zinc from industrial processes.

OCEAN POLLUTION
GENERAL INFORMATION:

1. For many years, man thought that diluting dangerous chemicals in water was a safe way to get rid of them.

2. Since marine wildlife began to decline and diseases appeared in marine animals and humans, scientists began to realize the effects of many chemicals.

3. The oceans do have some ability to cleanse themselves but today man pours so many pollutants and garbage into the oceans that they are no longer self-cleaning.

OCEAN POLLUTION
GENERAL INFORMATION:

1. Pollutants have the ability to travel far from their original source. They travel through the air, through the land, and even through the ocean itself.

2. Pollutants in the atmosphere are blown by the wind over the oceans and fall in the form of acid rain. Acid rain can fall hundreds of miles from its original source thus polluting large areas of the Earth's surface.

3. Pollutants in the ground travel into the oceans through underground water or as runoff into streams and rivers. Once in the ocean, underwater currents and turbulence far below the surface can move contaminants over a broad area.

OCEAN POLLUTION CAUSES & CONCERNS:

1. Cities are one of the main causes of ocean pollution. Overflowing sewers in large urban areas often spill raw sewage into the sea. Garbage from large cities is collected and sometimes dumped directly into the sea.

2. Toxic runoff water in farming areas includes fertilizers, pesticides, herbicides and topsoil which are carried into streams and rivers and then empty into the oceans contaminating the coastal waters.

3. Motor oil from highways and parking lots, animal manure from farms, and untreated garbage which backs up in sewer systems, all find their way into the ocean as runoff from the land.

OCEAN POLLUTION CAUSES & CONCERNS:

1. Poorly planned harvesting of many marine species for human consumption has vastly decreased these populations. Numerous varieties of fish are no longer readily available to commercial fishermen.

2. Fish and shellfish often eat toxic algae which has been contaminated by acid rain, PCBs, and heavy metals like lead and mercury. When this occurs, the fish and shellfish are inedible for humans.

3. Beaches in some places are unuseable due to trash, chemicals and sewage floating onto shore. Disposal from hospitals which has been dumped at sea has drifted into some beaches exposing swimmers to such things as hepatitis and AIDS.

OCEAN POLLUTION CAUSES & CONCERNS:

1. Recreational boaters, fishermen, Navy ships, commercial freighters and ocean liners dump their garbage overboard.

2. Barges hauling urban garbage, industrial byproducts, and toxic wastes take their loads out to sea and dump them directly into the water. Sludge, the slushy mud created by sewage treatment, is dumped from barges directly into the ocean in many places.

3. Oil tankers are responsible for both accidental and deliberate oil spills which spread for many miles, killing many types of marine life.

OCEAN POLLUTION CAUSES & CONCERNS:

1. About six million tons of oil enter the oceans each year from oil production, transport and natural seepage. That amount has been increasing with major oil spills in recent years.

2. Over half of the oil in the oceans is from deliberate discharge from oil tankers or carelessness, such as pouring used motor oil into drainage systems.

3. Oil refineries located along coasts discharge 200,000 tons of oil each year from accidental oil loss and seepage.

OCEAN POLLUTION
CAUSES & CONCERNS:

1. Much of the waste dumped overboard from ships and small boats includes plastics which kill millions of sea birds, mammals, and fish every year. Approximately 700,000 plastic containers are dumped into the ocean each day.

2. Many animals get their heads stuck in plastic six-pack holders from soda pop or beer. The plastic becomes so tight they cannot swallow, so they die.

3. Thousands of tons of fishing nets which are discarded each year entangle many sea birds and animals. The sea life choke or starve to death in the nets or fishing lines.

OCEAN POLLUTION
CAUSES & CONCERNS:

1. Huge amounts of sediment deposited along coastal waters are of critical environmental concern. Major causes of sedimentation are deforestation, construction, diking, filling, dumping, and offshore mining and drilling.

2. Deforestation of the tropical rain forests is the most critical cause of sedimentation. The denuded land left by clearcutting cannot hold its topsoil which is washed by rain into streams and rivers.

3. Deposits of sediment at the mouths of rivers, in bays and estuaries are destroying marine plants and animals by burying them and by blocking sunlight.

OCEAN POLLUTION
CAUSES & CONCERNS:

1. Red tides and brown tides are caused by rapid growth of algae feeding on manufactured fertilizers and other chemicals coming into the oceans from agricultural and industrial runoff.

2. Algae can grow so rapidly that it becomes thick enough to block sunlight to plants underneath. These plants eventually die from lack of sunlight.

3. When large amounts of algae die, they decay. This decaying uses up so much oxygen that many sea creatures in the area do not have enough oxygen to survive.

OCEAN POLLUTION
CAUSES & CONCERNS:

1. Another dangerous form of water pollution is radioactivity from nuclear power plants, weapon tests, and dumping of radioactive waste.

2. Certain radioactive elements which are being dumped into our oceans can cause cancer to marine life as well as to humans who consume it.

3. Radioactive waste in steel containers on the ocean floor is only safe for a limited time. Corrosion to the containers and turbulence from deep sea "storms" eventually will cause them to deteriorate and leak their contents.

OCEAN POLLUTION GEOGRAPHY:

1. The chemical industry in the United States is responsible for the largest amount of toxic pollution reaching the coastal waters of North America and the oceans of the world.

2. Along the east coast of the U.S. and Canada, ocean pollution has reached some of the highest levels anywhere. For example, the highest pesticide levels found in any marine mammal have been found in harbor seals along the east coast.

3. Fishermen along the east coast have been hauling up lobsters and crabs with large holes in their shells and fish with rotted fins and lesions caused by toxic chemicals in the oceans.

OCEAN POLLUTION GEOGRAPHY:

1. Patches of water that have been almost totally depleted of oxygen because of pollution are called "dead zones" and proliferate in the Atlantic Ocean along the east coast of the U.S., throughout the Mediterranean Sea and the Pacific Ocean around Japan.

2. Shellfish beds along the east and west coasts of the United States and in the Gulf of Mexico close frequently because of pollution which makes the shellfish too contaminated to eat.

3. In the Antarctic, DDT (a pesticide) has been discovered in the fat of penguins living there. This is thousands of miles from the source of the DDT.

OCEAN POLLUTION GEOGRAPHY:

1. San Francisco Bay is contaminated with lead, mercury, copper, nickel, cadmium and other heavy metals. The rate of increase of toxic discharges is over 20% per year.

2. Around Los Angeles and Santa Monica Bay, urban runoff and overflow from sewage treatment plants have almost destroyed local marine ecosystems.

3. Skin divers are prohibited from swimming off Point Loma, a popular area near San Diego, because of the risk of bacterial infection from sewage contamination in the area. Beaches have also closed in polluted areas from Maine to Florida.

OCEAN POLLUTION GEOGRAPHY:

1. Japan relies upon the oceans for 60% of its animal protein supply compared to a global average of 15%. In the early 1950's, many people in Japan were poisoned by eating tuna with high concentrations of mercury in their tissues.

2. The Soviet Union draws more and more of its protein supply from the oceans. The average Soviet citizen today eats twice as much fish as an average American.

3. Overfishing by American and European fishermen has caused a drastic decline in stocks of herring, cod, halibut, haddock, and other commercially important fish species in the North Atlantic.

OCEAN POLLUTION GEOGRAPHY:

1. The world's fishing fleets are dominated by a few nations with enormous, technologically efficient ships which are capable of massive harvests.

2. Japan, the Soviet Union, the United States, and several Northern European countries have major fishing operations in every ocean. Their nets are sometimes hundreds of miles long.

3. Harvests of virtually every type of commercially caught fish in the world have declined over the past ten years due to overfishing in every ocean around the globe.

OCEAN POLLUTION GEOGRAPHY:

1. Most pulp mills currently use chlorine bleaching to whiten their paper. This releases harmful chemicals called dioxins into the water. Dioxins from pulp mills are polluting the oceans in many countries around the world.

2. Canada and the United States are the world's major paper makers and producers of industrial chlorine pollution.

3. Safe alternatives where oxygen is used in place of chlorine for paper production are currently in use in Sweden, Germany and Japan.

OCEAN POLLUTION GEOGRAPHY:

1. Marine mammals are endangered in every ocean on the Earth. This includes whales, dolphins, porpoises, seals, sea otters, manatees, walruses, and sea lions.

2. Japan, Russia, and other countries are still responsible for the deaths of many whales because of commercial whaling. The majority of species of whales are now endangered. The blue whale may be extinct.

3. Millions of dolphins and porpoises die each year when they are accidentally caught in fish nets in the Pacific and Indian Oceans. Some of these nets are operational and some are abandoned ones that simply drift for years.

OCEAN POLLUTION GEOGRAPHY:

1. The waters of the world's oceans all mix together. The global circulation of ocean currents means that no part of the ocean is free of pollution.

2. Pollution "hotspots" (coastal areas close to large industrial areas and regions of high population) create pollution that can be carried to every part of the Earth because of these currrents.

3. Oil tanker routes cover the globe although most of their accidents occur along congested routes near the coasts. Spilled oil can drift wherever ocean currents carry it.

OCEAN POLLUTION SOLUTIONS:

1. Since humans have caused the problem of ocean pollution, it will be up to us to solve it. **Preventing** pollution, rather than curing it, is the most important requirement to save our oceans.

2. Industries must learn to recycle their waste and develop new products to prevent ocean pollution. Harmful chemicals must be replaced rather than "treated" in order to make the oceans safe. Again, we need to **prevent** ocean pollution rather than cure it.

3. Action must be taken at three levels: internationally, regionally or nationally, and locally. Countries must cooperate with each other to work on these problems. And individual citizens must take action in their communities to address the problems of ocean pollution.

OCEAN POLLUTION SOLUTIONS:

1. International agreements are being created to diminish plastics in the oceans, although not all nations agree to participate.

2. In 1988, 33 nations signed an agreement that makes it illegal to dump plastic debris in the ocean. The United States government has made it illegal for boats from any country to dump plastics into U.S. waters.

3. One long range solution to the plastics problem would be to develop replacement products made out of biodegradable materials. Wood products that can be used to replace plastics are being researched.

OCEAN POLLUTION SOLUTIONS:

1. International cooperation can also reduce the causes of ocean pollution. Cooperative agreements need to be carefully monitored to ensure that all nations comply.

2. Twenty-five nations ratified the MARPOL agreement which limits the amount of oil and toxic waste that ships can discharge. The United Nation's Regional Seas Program includes ten ocean regions around the planet where clean-up efforts are underway.

3. The MARPOL agreement also prohibits any discharge of oil or toxic waste in sensitive areas such as the Mediterranean Sea. Unfortunately, enforcement is difficult and illegal dumping often occurs.

OCEAN POLLUTION SOLUTIONS:

1. By 1988, sixty-three (63) countries had signed the London Dumping Convention agreement which requires participating nations to report and regulate any dumping of waste into the oceans.

2. The London Dumping Convention has also required that all ocean incineration end by 1994. Incineration is a process where industrial toxic wastes are burned at sea, releasing extremely toxic substances into the oceans.

3. The many countries who have not signed such agreements need to be persuaded to join or they will continue to incinerate and dump waste from countries that have signed.

OCEAN POLLUTION SOLUTIONS:

1. The only real solution to toxic pollution is to eliminate the **source** of the problem. Laws are necessary to prevent the use and production of toxic materials. The countries causing the greatest ocean pollution should be responsible for creating and implementing the strictest laws.

2. One approach to preventing toxic pollution would be for countries to make laws that increase penalties for toxic waste pollution.

3. Another method would be for governments or other organizations to give rewards for developing safe alternatives to dangerous chemicals.

OCEAN POLLUTION SOLUTIONS:

1. Because the burning of fossil fuels is dangerous to the oceans and the land, we must find new ways to improve energy efficiency and develop sources of renewable energy.

2. Safe, renewable sources of energy need to be developed in both industrial and developing countries. In order to implement this, international guidelines may have to be compulsory.

3. Some possibilities for energy in the future include solar radiation, wind, ocean tides, currents and water temperature differences, and geothermal energy.

OCEAN POLLUTION SOLUTIONS:

1. Organic farming, farming without manufactured fertilizers and pesticides, is one alternative to the problem of agricultural chemicals ending up in oceans.

2. Organic farms recycle agricultural wastes, rotate crops, and use natural forms of weed and pest control.

3. By buying only organically grown produce, we can encourage supermarkets to increase the amount of organic products they purchase. Four supermarket chains in the U.S. have already announced that they will phase out all produce grown with manufactured chemicals.

OCEAN POLLUTION SOLUTIONS:

1. There are substitutes available for many of the toxic household chemicals which end up in the oceans by getting washed down drains. Such substances as borax, baking soda, and vinegar can all be used in place of more toxic products for cleansing and disinfecting.

2. Paints, solvents, cleansers and disinfectants all contain hazardous chemicals which frequently end up in our oceans. These can be replaced by non-toxic substances.

3. One of the most important ways to help solve ocean crises is for students to inform and educate others through word of mouth, letter writing, making posters and bumper stickers, and staying informed about ocean problems and the work being done to solve them.

5 Scavenger Hunt

Discovery: A Scavenger Hunt

A Scavenger Hunt is an exciting way to learn about any topic. Designed as a data collecting activity, it is a motivating way to encourage students to collect facts and information from a variety of sources. Many of the items collected or created will encourage students to think more deeply about their topics.

The intent of the Scavenger Hunt is to prepare students for the section on Researching Your Topic. The Scavenger Hunt also provides an abundance of information in a variety of ways—pictorials, maps, graphs, charts, models, dioramas, poems, tee-shirts, brochures, reports, and posters.

The materials gathered during this activity are valuable for the research section. They provide a good resource for quick information when students are problem-solving. Some of the items such as songs, charts, and murals may also be displayed or used in the final presentations on the last day of the Summit. If your Summit is going to be a school-wide or community event, these displays are an excellent way to inform others about the issues your class has studied.

Structuring a Scavenger Hunt

Introduce this activity by asking students if they have ever participated in a scavenger hunt. Explain that they will work together in teams to collect data or create as many of the projects on the Scavenger Hunt list as possible, within a given amount of time. If you would like this to be a competitive activity, the group that collects the most points may be declared the winner.

Divide your class into groups of approximately four students and pass out the Scavenger Hunt list. Tell the class they will have six days to gather information and create their products. On the seventh day, the points are tallied and the information is shared. It is recommended that some class time be initially provided so that groups may meet and work collectively on their projects.

After handing out the Scavenger Hunt information, give students 15 to 20 minutes to go over the list and plan a strategy. Stress the importance of developing a TEAM STRATEGY. Suggest that they decide what steps are needed to successfully complete the task. This might include assigning individual duties, establishing a timeline, and deciding their total point goal. Individual jobs might include record and tally keeper, researcher, artist, etc.

Students may also suggest additional projects, that do not appear on the Scavenger Hunt list. In this case, groups must get your permission and have you assign a point value before adding any new suggestions.

It is helpful to post each group's total point goal. As materials are brought in, they can be listed and tallied. This keeps a running total, provides a convenient way to check progress, and is a great motivator! It also shortens the final tallying process and allows for extra sharing time.

Within two or three days, your classroom may well be overflowing with data in a myriad of forms. Some teachers have used their hallways to display the information, indeed an effective way to share the wealth of facts your students have gathered.

On the seventh day, tally the data and provide class time for sharing the final projects. Point values can be assigned according to the quality of the product. If you deduct points, explain to students why and make suggestions for improvement.

Evaluation of the Activity

After the Scavenger Hunt is completed, pass out the Discovery Evaluation for each student to complete. Allow 10 to 15 minutes for groups to discuss each of the questions, then approximately 15 to 20 minutes for students to complete the evaluation individually.

The Discovery Evaluation responses will indicate the amount of knowledge gained in the hunt and will reveal any further questions the students may have. These questions can be posted and used to initiate the next activity, Researching Your Topic.

The Scavenger Hunt and Nothing But the Facts activities will motivate students to begin researching the complex problems associated with their global issue.

This activity was inspired by the "Cultural Studies Series—Teaching About Diversity: Latin America," University of Denver, Center for Teaching International Relations. The program uses a similar process for helping students learn about Latin America.

Ocean Pollution Discovery
A Scavenger Hunt

Ocean pollution is a serious worldwide problem that threatens the well-being of all marine as well as human life on the planet. Our oceans are used as giant waste receptacles. Humans are responsible for tons of pollutants entering the oceans each year in the form of industrial and agricultural chemicals, acid rain, garbage, sediment, and urban runoff. Ocean pollution damages the health of marine plants, animals and even people. The oceans cover almost three-fourths of the earth's surface. They are where all life began. The health and well-being of our planet depend, to a great extent, upon the health and well-being of our oceans.

There are many things people can do to decrease the fouling of the seas. One of the most important things to do is to become informed. Learning about ocean pollution and other ocean problems and sharing what you know with others is an effective step towards reducing this environmental threat. The following Scavenger Hunt will help you learn about many aspects of this complicated problem.

Rules for Scavenger Hunt

1. You must work in groups with each member contributing equally to the whole group effort.

2. You can go anywhere that is appropriate to obtain your data. Cameras and tape recorders may be used to record information. Written summaries of television shows, hand-drawn maps and diagrams are acceptable.

3. Use primary sources when possible.

4. The sources of all data must be recorded.

Items to Collect and Create

1. Make a map of the world showing where the different types of ocean pollution are located. (10 points)

2. Collect five pictures of areas affected by ocean pollution. (5 points) BONUS: Add 10 points if you label your pictures and include two facts about each picture.

3. Collect two articles from magazines that explain efforts to reduce ocean pollution. (5 points) BONUS: Add 10 points if you include a written summary of the articles.

4. Create a chart that ranks the main causes of ocean pollution and other ocean problems. (5 points)

5. Draw a before and after picture of a coastal area which has been damaged by some type of pollution. Include labels and information about where the area is located and what has happened to it. (15 points)

6. Watch a television show that talks about the problem of ocean pollution. Create a chart or poster that shares what you learned from the television show. (10 points) BONUS: Add 10 points for each additional show viewed.

7. Make a chart that lists organizations which help fight ocean pollution. Include the names of the organizations, addresses and phone numbers. (10 points)

8. From the list below, choose one of the problems caused by runoff from factories, farms or cities. Write a poem or song that includes at least five facts about the problem. Mention in the song the necessity for finding ways to solve the problem. (20 points)
   a. explosive growth of algae
   b. contamination of shellfish
   c. disruption of food chains
   d. overfishing in commercial fishing grounds

9. Create a timeline that shows the increase in ocean pollution from approximately 1950 to the present. (15 points)

10. Design and make a poster that informs others about ocean pollution. (15 points)

11. Make a list of at least five different kinds of toxic chemicals that are dumped into the oceans each year. Explain how the chemicals are used. (10 points)

12. Make a model of a factory that recycles its waste products rather than producing toxic wastes or contaminants which may enter the oceans. (15 points)

13. Investigate to see if pulp and paper mills in the United States are doing anything to stop the use of dioxin producing chlorine. See if they are using substitute methods of bleaching that are less harmful to the environment. Write a paragraph explaining your findings. (10 points)

14. Make a mobile with pictures or drawings showing the main sources of ocean pollution. (10 points)

15. Draw a map that traces the route acid rain may follow from its source on land to a marine environment where it is deposited. (10 points)

16. Write an article for your school or community newspaper that explains the problem of ocean pollution. Give five suggestions for what individuals can do to help combat this problem. Submit the article for publication. (25 points)

17. Design a t-shirt or button that would make others aware of ocean pollution. (15 points)

18. Draw a model of a non-polluting garbage processor to be used on ocean going ships. Write an explanation of how it could safely and cleanly process or recycle on-board waste. (15 points)

19. Research what one state is doing to reduce ocean pollution. Make a list or chart explaining its efforts. (10 points)

20. Imagine a model coastal community that effectively eliminated ocean pollution. Write a story about how the community was able to achieve this. (25 points)
BONUS: Add 10 additional points if your story has two or more illustrations or charts.

21. Make a chart that explains how global ocean currents can spread pollutants from one part of the planet to another. Also indicate on the chart how specific pollutants from one area might be found in a distant part of the earth's oceans. (15 points)

22. Collect three pictures of the effects of ocean pollution on ocean mammals, fish, shellfish, or marine plants. Label them and explain the damage that has been done. (10 points)

23. Make an Ocean Pollution Alphabet Book that tells about this problem. (25 points)

24. Research what is being done to revive oceans, seas, and coastal areas damaged by ocean pollution. Write an explanation of the reclamation effort. (15 points)

25. Prepare and perform a skit for your class that includes at least ten facts about ocean pollution. (15 points)

26. Interview someone from a nearby governmental agency dealing with problems of marine pollution. Find out what any citizen can do to reduce the amount of pollution. The interview can be conducted over the phone or in person. Before you do the interview, make sure that you have a list of questions you can ask. Make a chart of the suggestions to be displayed at school. (20 points)

27. Locate on a map at least five major cities around the world that suffer from pollution of their coastal waters and beaches. Write a description of any related health problems experienced by the residents of these cities. (10 points)

28. Draw a diagram demonstrating the reactions of agricultural chemicals on the coastal environment where they are deposited. Show how these chemicals affect algae, plant life, and fish. (10 points)

29. On a world map identify where tropical rainforests were once located, where they have been destroyed, and where they remain. Write a paragraph explaining how the destruction of the tropical rainforests contributes to ocean pollution. (15 points)

30. Make a list of toxic household chemicals, detergents, etc. . . which end up in the oceans by getting washed down the drains. Then, make a list of non-toxic biodegradable substitutes. Compile your list and make an advertisement or produce a commercial promoting the "better alternative." (10 points)

31. Create your own items for the scavenger hunt on ocean pollution. Get your teacher's approval and together determine the number of points possible.

Evaluation Sheet for Discovery

NAME:______________________________DATE:__________

TEAM MEMBERS:____________________________________

____

1. What information did you discover that indicates how critical this problem is?

2. What was the most interesting thing you discovered? Why?

3. Can you find two pieces of data that pose contradictory information about this problem? List the sources and the differences discovered and why you think they are in conflict.

4. Which item or activity gave you the most useful information? Why?

5. As a result of this Scavenger Hunt, what new action will you take to better understand and help solve this critical problem?

6. Describe the strategy used by your group to complete the Scavenger Hunt. How did it work? What would you do differently next time?

7. Did you experience any conflict in your group? Describe the conflict and how you did or did not resolve it.

8. What did you like best about this activity?

9. What would you change about this activity?

10. During the past week while working on the Ocean project I would like to thank ________________ for . . .

11. In order to relax right now, I would like to . . .

12. If I were evaluating my Ocean project work, I would say I have earned __________________ because . . .

13. If I were evaluating my group's Ocean project work, I would say we have earned _________________ because . . .

6 Map Activity

Where in the World? A Brief Geography Lesson

This activity will provide students with the opportunity to develop map-reading skills. Each student will need a small map of the world that includes longitude and latitude lines. You should have a large world map to demonstrate your explanations.

First, explain the concepts of longitude and latitude to the students. You might want to share the fact that these imaginary lines enable us to locate any point on earth. Latitude lines run around the world parallel to the equator. The equator has a latitude of 0 degrees. The North Pole has a latitude of 90 degrees north, sometimes shown as +90 degrees. The South Pole has a latitude of 90 degrees south, which is sometimes written -90 degrees. Ask students to locate the equator and the North and South Poles.

Longitude lines run north and south. Most nations count longitude east and west beginning with an imaginary line at Greenwich, England. Greenwich lies at 0 degrees longitude. A place halfway around the world from Greenwich is at 180 degrees longitude. The earth is divided into two hemispheres, each with 180 degrees. Longitude locations west of Greenwich are referred to as west longitude and those east of Greenwich have east longitude locations. Ask students to locate Greenwich and areas east and west of Greenwich as well.

Once students understand the concepts of longitude and latitude, ask them to look at their maps and find the longitude and latitude of major cities such as Los Angeles, New York, Miami, or Seattle. Have them look for a country and give the coordinates which the nation encompasses. When students are able to identify the correct meridians, they are ready to move on to the next activity.

Ask students to individually consider one place in the world where their global problem is especially severe. They could consider cities, countries, oceans, continents, etc. Instruct students that they are not to share with others where their trouble spot is located. When they have decided upon their global problem area, they then need to determine the latitude and longitude of this location. It is now time for geography riddles! Students will, one at a time, tell the class the longitude and latitude degrees of their particular spot. Class members are to locate these meridians on their maps and tell the name of the place. The student who has given the meridian points must validate the responses, and also must share the specific nature of the global problem at that location. You may also ask students to draw or note on their maps information they have learned to date. Additional data can be added as it accumulates.

Where in the World? A Brief Geography Lesson

This activity will acquaint you with map-reading skills. You will need a small map of the world that includes longitude and latitude meridians.

To read maps, you'll need to understand the concepts of longitude and latitude. These are helpful imaginary lines that enable us to locate any point on earth. Latitude lines run around the world parallel to the equator. The equator has a latitude of 0 degrees. The North Pole has a latitude of 90 degrees north, sometimes shown as +90 degrees. The South Pole has a latitude of 90 degrees south, which is sometimes written -90 degrees. Locate the equator and the North and South Poles on your map.

Longitude lines run north and south. Most nations count longitude east and longitude west, beginning with an imaginary line at Greenwich, England. Greenwich lies at 0 degrees longitude. A place halfway around the world from Greenwich is at 180 degrees longitude. The earth is divided into two hemispheres, each consisting of 180 degrees. Longitude locations west of Greenwich are referred to as west longitude and those east of Greenwich as east longitude. Locate Greenwich on your map. Identify some west and east longitude locations on your map.

To further practice the concepts of longitude and latitude, look at your map and find the longitude and latitude of major cities such as Los Angeles, New York, Miami, or Seattle. Look for a country and give the expanse of latitude and longitude meridans which the nation encompasses.

Next, consider one place in the world where a global problem is especially severe. You may want to consider cities, countries, oceans, continents, etc. Do not share with others where your trouble spot is located. When you have decided upon your global problem area, next determine the latitude and longitude of that location. It is now time for geography riddles! When it is your turn, tell the rest of the class the longitude and latitude degrees of your spot. Your class members are to locate the meridians on their maps and tell the name of the place you have chosen. You will need to validate their responses and also share the nature of the global problem at your location. Enjoy guessing your classmates' riddles as well.

7 Research and Independent Study

Self-Directed Learning: Researching a Global Issue

In the following activity, students have the opportunity to direct their own learning. Students will pursue a topic of personal interest, develop their own approach to research, and create their own project design. The intention of the self-directed activity is to let students assume responsibility for their learning. They will enjoy pursuing a topic of special interest to them while mastering independent learning skills, useful both within the classroom and without.

Students will progress through a five-step process. First, provide students with copies of Steps to Self-Directed Learning and the Independent Project Contract located on the following pages. Introduce each of the steps by having a brief class discussion to clarify and explain what is expected of them and also to address any questions they might have. You may want to brainstorm possibilities for study with the entire class. Students can refer to the list as a starting point when choosing their topics. You may also want students to keep their self-directed learning papers in some sort of file folder. The entire process can span from one to three weeks.

After completion of their independent research and in-class presentations, you may want to suggest that students share their knowledge with other classes, other schools, or create community forums. Or, you and your students may decide to wait for Step 2 of the Summit process to share their research in small groups.

To bring closure to this unit, you might ask your class what they have learned about being a creative and independent learner and how the skills used in this lesson can be applied to "everyday life."

Steps to Self-Directed Learning

Researching a Global Issue:

From your previous activities with the Fact Cards and the Scavenger Hunt, you have acquired a lot of information about your global topic. You will now have the opportunity to select one aspect of this topic that holds special concern for you. What have you encountered so far that was particularly interesting? Is there something more you would like to find out about?

STEP 1

So that you can independently direct your own learning, you will first need to decide upon your topic. Select one aspect of the global problem that intrigues you. You may instantly know what you would like to study or you may want to refer back to the Fact Cards or the Scavenger Hunt for ideas. Once you have determined your area of interest, narrow your topic down so that it is manageable to research. Get your teacher's approval before you begin Step 2.

STEP 2

To complete Step 2, you will need to make decisions about two important aspects of your project. First, determine at least three things that you want to learn. To do this, write your topic down on a piece of paper, then list a minimum of three items you are curious about. Perhaps you will want to answer the questions: **who, what, when, where** and **why** as they relate to the subject. Perhaps you have questions that spring to mind immediately. Once you begin researching, you may change your mind about some of the original questions you listed, or something else may appear intriguing. Do go ahead and pursue your new interests if this should occur. However, it's important to begin your research with a focus.

After you have written what you want to know about your topic, write a paragraph explaining what your final achievement will be. Perhaps you will create a model or a demonstration that will explain your subject. Be creative and develop an end product that will be fun and interesting for you to do, for example, make a model, write a song, do a collage, or make up a story or skit that includes factual information.

STEP 3

Once you have determined your topic and what you want to learn about it, you need to gather information. Data can come from books, but it can also be found in a variety of other sources. Your research will be enjoyable if you use many different approaches to gathering information. Identify three ways to gather data. You may want to choose from among the following, or create your own suggestions:

- Call a nearby university or other organization to determine if someone there is knowledgeable about your topic. If so, conduct a telephone interview. To do this, you will need to make a list of questions ahead of time so that you are fully prepared before speaking with the expert.

- Use your school or city library. Do not rely strictly on encyclopedias or books. Ask your librarian to help you locate governmental documents, films, videotapes, magazines, and newspapers that may contain information you need.

- Watch for pertinent television or radio shows. Check the educational television station in your area to find out what their programming includes.

- Your teacher can order films and videotapes on your topic from the educational service district nearest your school. You may want to request that either you or your instructor look through the film catalogue to determine what might be of value to your research.

- Conduct a survey at school or in your neighborhood where you ask people pertinent questions. Record their answers on a survey form that you create.

What are other suggestions you might have for finding the information you will need? Write on a piece of paper the three approaches you will use in your data collection.

STEP 4

Now that you have determined your topic and how you'll conduct your research, you are ready to complete an Independent Project Contract. This will provide both you and your teacher with an overview of your entire self-directed learning experience. Please complete the following form and have your teacher initial it. Enjoy learning independently!

Independent Project Contract

Student Name____________________

Date____________________

Project ____________________

Title____________________

Planned Completion Date____________________

Three items you will learn about your topic:

1.

2.

3.

Three information sources you will use:

1.

2.

3.

Final Product:

Project Timeline: List what you will accomplish and when:

Presentation: Describe what you will share with the rest of the class and when you will do the sharing:

Teacher initial: ________

STEP 5

After you have completed your in-class presentation, you can then evaluate the quality of your work. Your instructor will provide you with feedback as well. The following form can be used by both you and your teacher to determine what is done well and what is in need of improvement.

Evaluation of Self-Directed Learning Experience

Student name: ____________________

Process Evaluation

1. Used time effectively in class:

1	**2**	**3**	**4**	**5**
Least time effective				Most time effective

Comments:

2. Used time effectively outside of class:

1	**2**	**3**	**4**	**5**
Least time effective				Most time effective

Comments:

Project Evaluation

1. Used a variety of different information sources:

1	**2**	**3**	**4**	**5**
One information source				Five or more information sources

Comments:

2. Completed project according to the project timeline:

1	**2**	**3**	**4**	**5**
Project not on target				Completed

Comments:

3. Showed effort:

1	**2**	**3**	**4**	**5**
No effort				Excellent effort

Comments:

4. Creativity:

A. Fluency (number of ideas)	**1**	**2**	**3**	**4**	**5**
B. Flexibility (different ways of sharing ideas)	**1**	**2**	**3**	**4**	**5**
C. Originality (uniqueness)	**1**	**2**	**3**	**4**	**5**
D. Elaboration (development of ideas)	**1**	**2**	**3**	**4**	**5**

Comments:

5. Other Comments:

8 Youth Summit

Overview of a Youth Summit

Once students have completed their research, they are ready to begin the Summit process. The Summit uses a problem-solving approach that encourages the use of creative and critical thinking skills. The particular model outlined for the Summit process is a synthesis of the work of E. Paul Torrance, Alex Osborne, and Bob Stanish. Some aspects have been adapted to fit the needs of the Summit.

The Summit is designed to encourage students to take action. It also serves to alleviate any frustration, anxiety, and/or fear that may have built up as a result of the in-depth research done in the previous activities.

By going through the Summit process, students will develop the skills inherent to effective problem solving. The process stretches students to engage in higher cognitive functioning, to learn to work effectively in groups, and to improve their communication and writing skills. Most important, it moves students from the level of theory to the level of practical application.

Structuring a Youth Summit:

Time

The entire process, including the final presentations, will take approximately 8 to 12 hours. This can be structured as a Summit or it can be extended over a week-long period. We recommend a two- to three-day Summit to focus student interests and to provide uninterrupted time for concentrated exploration. However, this is not always possible. Conducting the Summit over a one-week period can work well, especially if you provide time to review the previous day's work and facilitate closure at the end of each working period.

Materials

We recommend that each student be provided with a copy of the Summit Journal. This outlines the problem-solving process and provides a place for your class to record their efforts. This becomes a valuable evaluation tool and should be checked at various intervals throughout the Summit. Additional materials include butcher paper and colored marking pens. Art supplies and reference materials should also be available.

Establishing Problem-Solving Groups

We recommend groups of four to five students. If cooperative learning is new to your students, you might consider setting up groups of three. The grouping works best if it is heterogeneous in terms of ability and talents. You may want to have students work in the same groups as were arranged for the Scavenger Hunt activity.

Work/Display Area

If you are holding the Summit in your classroom, establish work/display areas for each group. Tables work best; however, desks can be put in a circle or square. If possible, provide wall and counter space so that students may display the information gathered during the Scavenger Hunt and Self-Directed Learning. Students will also be displaying information generated during the problem-solving process. You may want to establish one main resource area where books, pamphlets, posters, and articles may be stored for easy access throughout the Summit.

Problem-Solving Process

You will want to familiarize students with the problem-solving process before the Summit. See the next section, Facilitator's Guide, for more detailed information. For easy reference, we have included an agenda with approximate times.

Introduce each step to the entire class, and then have the students begin the process. Establish a time limit, then add more time if needed. Some groups may work through the process faster than others. You can give them instructions for going on to the next step.

As students work through the process, move from one group to the next to observe interaction. Clarify the process when necessary, help resolve group conflicts if they arise, and provide needed information or directions for finding it.

Preparing Presentations

At the onset of the Summit, explain to students that each group will be responsible for planning a 10- to 15-minute presentation for the class. This presentation will focus on informing others of the problem they have worked on and their proposed solutions. Students should start thinking about this at the onset. They are encouraged to be creative in the manner with which they present their material. Encourage them to use charts, graphs, illustrations, pictures, skits, poems, songs, dances, or stories to teach the others. They might also consider ways to get their classmates involved in helping them carry out their solutions.

At the conclusion of each presentation, allow time for questions or suggestions from the audience. This period can take up to three hours depending upon the number of groups sharing and the length of the presentations. Group presentations often range from five to twenty minutes.

You may also decide that your students should share their work with other classrooms, schools, parents, and/or community members. To manage this step, ask students to submit an outline of their project for your approval. Also, students will need time to rehearse. Much of the materials produced during the Scavenger Hunt can serve as visual displays; however, some groups may need additional time to develop props, costumes, charts, and hand-outs.

Taking Action

This is the most exciting part of the process. Here students take action and begin effecting change. It may be necessary to set aside time each week for students to work on their action plans. There are a myriad of possibilities for taking action and you may find your class involved in creating a game, making a film, writing a book, starting a newsletter, raising money for a project, conducting research, getting signatures for a petition, surveying the community, or making public service announcements for a local television station, to name a few of the possible outcomes.

NOTE: The processes and times shown on the following page are merely suggestions. You are encouraged to make adaptations to fit your needs and classroom situations.

Our Only Earth

Youth Summit Agenda

(Suggested Times)

STEP 1 — Introduction/Problem Exploration (30 minutes)

STEP 2 — Sharing Research (1 - 1.5 hours)

STEP 3 — Brainstorming Problems (30 minutes to one hour)

STEP 4 — Brainstorming Solutions (30 minutes to one hour)

STEP 5 — Evaluating Solutions (1 - 1.5 hours)

STEP 6 — Carrying Out Solutions (1 - 1.5 hours)

STEP 7 — Presenting Solutions (1 - 3 hours)

Facilitator's Guide: Youth Summit Process

STEP 1—Introduction/ Problem Exploration

GOAL: To share feelings, thoughts, and ideas surrounding the global issue.

OBJECTIVES: To communicate feelings, thoughts, and ideas concerning the issues surrounding the problem.

TIME: Approximately 30 minutes.

PROCESS: Begin by introducing the problem-solving process to be used throughout the Summit. It is helpful to go over each of the seven steps. Students can follow along in their Summit Journal, which serves as a guide as well as a place to record their progress. These journals are also helpful in evaluating students' work.

(OPTIONAL): Depending upon the age and experience of your class, you may want to practice the problem-solving process with a problem that students are currently trying to resolve, i.e., improving grades or saving money. This trial run will familiarize students with the key components of effective problem-solving and usually takes about one hour of class time.

No matter how you introduce the problem-solving process, emphasize the need for students to work together in a cooperative and collaborative manner. For information on implementing cooperative learning in the classroom, refer to the work of Roger T. Johnson and David W. Johnson. Their books are helpful in structuring cooperative learning in the classroom: *Learning Together and Alone, Circles of Learning*.

Once students are familiar with the Summit process, initiate Step 1 by having them record their individual reflections on their particular global issue. Ask them to write in their Journals any feelings, thoughts, ideas, images, and/or fears about this issue.

After students have an opportunity to reflect, allow time for sharing with members in their groups. You may also want to provide time for a classroom discussion. If so, have each group choose someone to summarize their discussion for the benefit of the whole group. Remind students that each time information is shared with the whole group, a new spokesperson will be selected. Encourage students to record any new bits of information, key ideas, or insights that emerge during the sharing.

STEP 2—Sharing Research

GOAL: To learn from others about the issue.

OBJECTIVES:

- Share research information.
- Categorize key ideas generated by the group.
- List any unanswered questions.
- Develop strategies for discovering answers to any unanswered questions.

TIME: 1 - 1.5 hours.

PROCESS: In this step, students share their independent research, completed in the previous activity (self-directed learning), with members of their problem-solving groups. After the presentations and sharing of research, have students categorize key ideas and information on a Data Retrieval Chart. An example is given below. Have students make their own chart on a large piece of butcher paper. This information can be posted in the group's work area.

Sample Data Retrieval Chart

Name	Who	What	When	Where	Why

To complete the Data Retrieval Chart, each student summarizes and inserts the information in the appropriate categories. They begin by each placing their name in the correct column and then completing one horizontal section of the chart. Each student, then, should contribute a who, what, when, where, and why fact to the chart. The completed chart organizes and categorizes facts and information for easy reference during the Summit process.

Once students have shared their Independent Research Projects and have filled out the Data Retrieval Chart, you may want to allow time for each of the problem-solving groups to share their data and information with the entire class. Have problem-solving groups designate a NEW spokesperson.

As each group reports information, ask the other groups to indicate if they have listed similiar information. If so, they should mark this information so that it is not repeated again, but simply acknowledged. Groups are encouraged to add to their Data Retrieval Charts as new information emerges.

An additional use for the Data Retrieval Chart is to have students consider their global issue from diverse viewpoints. Students can first suggest a variety of individuals or organizations involved in their issue. For example, one issue might be the death of fish in a local river. Some of the people involved in this issue would be local fishermen, grocery store owners who sell the fish, a wood products industry that dispenses waste into the river, Greenpeace volunteers, Environmental Protection Agency officials, farmers who use chemical sprays on their crops that are then washed into the river, children who play along the river bank, etc. Each student could think of one group to list under the "name" section of the grid. Students can then add each group's perspective as they complete the who, what, when, where, why portions of the chart. Discussion can follow the sharing of the new perspectives involved. Point out to the students that there are always two or more sides to each issue.

STEP 3—Brainstorming Problems

GOAL: To brainstorm problems related to the issue.

OBJECTIVE:

- Identify specific problems by brainstorming sub-problems and contingent problems related to the situation.
- View the problems from a variety of perspectives.
- Choose a problem to solve.
- Define the problem.

TIME: Approximately 30 minutes to one hour.

PROCESS: Identifying the problems related to this global issue is one of the most important steps of the creative problem-solving process. Defining the problem properly will determine the quality and appropriateness of the students' solutions.

Introduce this step by emphasizing the importance of problem identification. Remind students that in identifying problems associated with this issue, it is important to view the problem from all angles. It is helpful to think about how people, nations, plants and animals are affected by this issue. Ask students to consider issues from different points of view.

Next, ask small groups to think about all of the problems related to the issue. Familiarize students with the rules of brainstorming, stressing the importance of withholding judgement, "piggybacking" on others' ideas, and freewheeling. Allow the groups approximately 15 to 20 minutes to brainstorm.

Afterwards, suggest that groups review the list of problems they generated. At this point, some problems may be combined or elaborated, as well as new ones listed.

Allow time for small groups to decide which of the listed problems they are most interested in solving. Once each group has chosen a problem, they are ready to move on to problem definition.

To define the problem, students need to think of different ways to state the problem. It is sometimes easier to generate solutions when the problem is posed as a question rather than a statement. Ask students to think carefully about the verb they use in their definition. A strong verb will focus their energies. An example might be: How can we *decrease* the amount of plastic dumped from motor boats into local waters? Or: In what ways can we inform our community about the dangers of runoff from pesticide sprays? Have students experiment with the use of different verbs when selecting their questions and ask them to answer the questions in this section of their Summit Journal. They will undoubtedly note that as they change their definition, the focus for solutions will also change.

As each group defines their problem, move about from group to group, checking for strong verb usage and making sure they are on the right track.

Once students have completed the task, allow time for reviewing information and facts, keeping in mind the specific problem they have chosen. New questions may arise, and students may find they need more information before they can generate solutions. If so, groups should plan a strategy for gathering new information. Depending on how many groups need to do more research, you may want to allow additional classroom time or have students complete the research as homework.

STEP 4—Brainstorming Solutions

GOAL: To brainstorm creative solutions to the problem.

OBJECTIVES:

- Apply the brainstorming process for generating solutions.
- Generate many ideas, simple or complex.

TIME: Approximately 30 minutes to one hour.

PROCESS: Provide problem-solving groups with approximately 20 minutes to discuss possible solutions. Remind students that the goal of brainstorming is to generate as many ideas as possible. Emphasize the importance of withholding judgment while deliberating. For now, they can let their creativity soar; wild and crazy ideas are acceptable. One of those ideas, after a little revision, just might be the solution they are looking for. Remind students not to overlook simple ideas; solutions can range from simple to complex, and sometimes the simplest solutions are the best! Encourage students to combine solutions or add onto the ideas of others.

As students come up with ideas, have them say their plans aloud while at the same time writing them down on scrap paper. Place all pieces of paper in the center of the group, to use in Step 5. Students may also want to record their ideas in their Summit Journals. Allow additional time if groups are still brainstorming after 20 minutes.

STEP 5—Evaluating Solutions

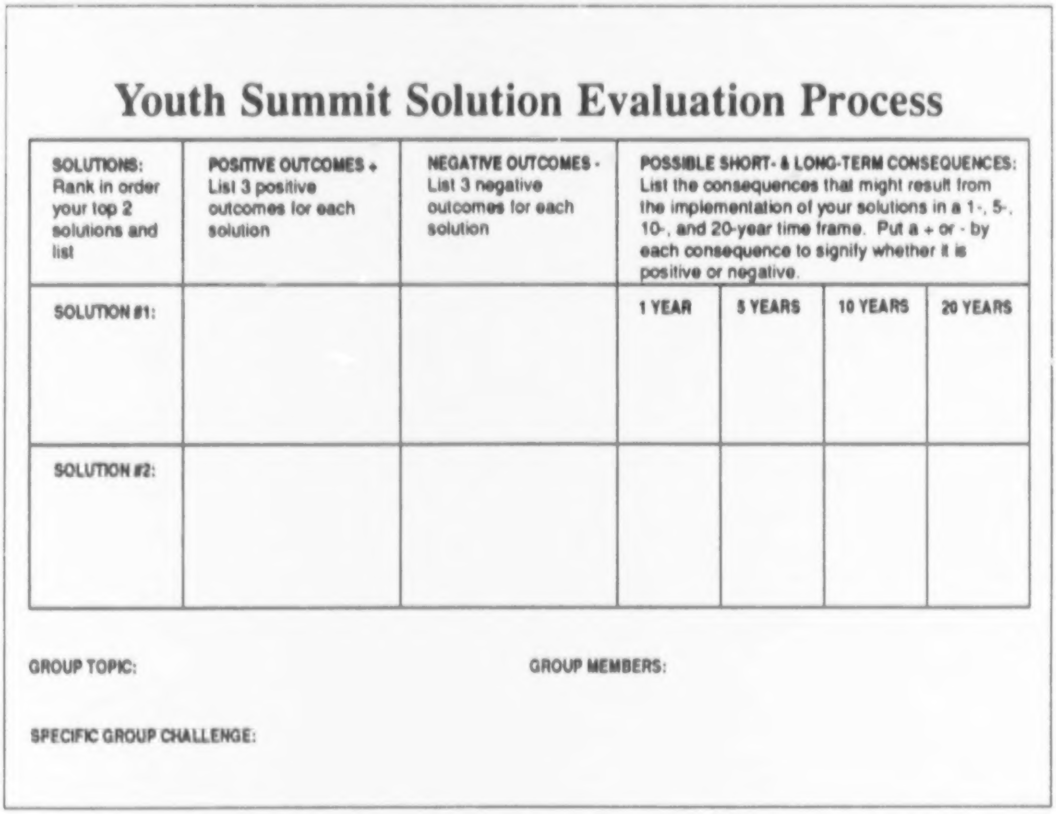
GOAL: To decide which solutions might be the best for solving the stated problem.

OBJECTIVE:

- Decide on the top two ideas.
- Evaluate possible positive and negative outcomes.
- Evaluate possible long- and short-term consequences.
- Evaluate solutions and make a final determination regarding the "best" solution.

TIME: 1 - 1.5 hours.

PROCESS: Provide small groups with about 10 minutes to decide on the top two solutions. These solutions should be listed in order on the Evaluation Grid located in their Summit Journal and shown below.



Youth Summit Solution Evaluation Process

SOLUTIONS: Rank in order your top 2 solutions and list	**POSITIVE OUTCOMES +** List 3 positive outcomes for each solution	**NEGATIVE OUTCOMES -** List 3 negative outcomes for each solution	**POSSIBLE SHORT- & LONG-TERM CONSEQUENCES:** List the consequences that might result from the implementation of your solutions in a 1-, 5-, 10-, and 20-year time frame. Put a + or - by each consequence to signify whether it is positive or negative.			
SOLUTION #1:			**1 YEAR**	**5 YEARS**	**10 YEARS**	**20 YEARS**
SOLUTION #2:						

GROUP TOPIC:

GROUP MEMBERS:

SPECIFIC GROUP CHALLENGE:

Once the top solutions have been selected, students begin the evaluation process. For each solution listed, students will go through the following three steps:

- POSITIVE OUTCOMES — Students list four or five of the possible positive outcomes. Positive outcomes should be considered from various points of view.
- NEGATIVE OUTCOMES — Students list four or five of the possible negative outcomes. This can be looked at from the different points of view examined in step one if applicable.
- POSSIBLE SHORT & LONG TERM CONSEQUENCES— In this step, students forecast the possible consequences that might result from the implementation of their solutions over a 1-, 5-, 10-, and 20-year time frame. For each consequence, students should put a + or - to signify a positive or negative consequence.

Once students have completed the evaluation process, have problem-solving groups decide which is the best solution in light of the positive and negative outcomes, including the possible short- and long-term consequences.

Suggest that small groups discuss their final solution. Encourage them to ask if the solution clearly reflects the thinking of the entire group. Changes might also now become apparent. Students may need to modify their solutions based upon the possible outcomes and consequences. Have students answer the questions on Modifying Your Solution in their Summit Journals.

STEP 6—Carrying Out Solutions

GOAL: To develop an action plan for carrying out the solution.

OBJECTIVES:

- Brainstorm different ways to carry out the solution.
- Create a step-by-step plan for carrying out the solution.
- Brainstorm ways to inform others about this problem and suggested solutions.

TIME: 1 - 1.5 hours.

PROCESS: Thomas Edison once said that creative work is " . . . one percent inspiration and ninety-nine percent perspiration." Remind students that this is the most important part of their work. Here, their creativity will be taxed as they discover ways to carry out their solutions. While this step demands much work, it is also the most gratifying part of the process since students become empowered to take action.

Remind students that a good part of their efforts will include informing people about the problem and their proposed solutions. This can be done through a variety of ways including songs, artwork, poems, stories, plays, newspaper articles, petitions, letter writing, and editorials.

This is also the time when students generate various ways to apply their theories. These might include a letter-writing campaign, adopting a concern, or developing an organization that informs other youth about this problem and what they can do.

Fund raising is another possible project. The funds can even be used to support students' projects and concerns. It's an excellent way to inform others as well as a practical way for students to see their work in action. You might want to spend time brainstorming possible fund raising options as a whole group. Suggestions include: raffles, selling students' art work, information booths at local and community events, car washes, and/or bake sales.

At past Summits, students have generated a wide variety of projects. These include: making a game about the effects of plastics on the environment, writing a book about the issues surrounding tropical deforestation with solutions from students around the world, creating a worldwide network of youth interested in working together to save the tropical rainforests, writing letters to congressmen, setting up a booth at a local carnival to inform individuals about the ocean crisis, creating a public service announcement, and making short films to inform people about wildlife's struggle to survive.

Once small groups have their ideas, allow 20 to 30 minutes for developing their Group/Individual Action Plans. These are included in the Summit Journals and should be completed by each student. These action plans require students to list each of the steps they need to take in order to carry out their solutions, as well as to identify the person responsible for each part of the action plan. Students will also create a timeline to indicate when they anticipate the completion of each step. Finally, students are able to reflect on what the end results of their efforts might be. This is cause for celebration!

Examples of the forms that the students will complete for Step 6 follow on the next two pages:

Action Planning

You will now need to organize how to carry out your group's solution. Each of you will have individual tasks to complete. On the form below, write down your group action plan.

Youth Summit Group Action Plan Form

Group Topic: ______________________________

Group Members: (Please list first and last names.)

Describe the specific problem your group decided to solve:

List your best solution:

List the specific steps your group will take to carry out the solution, beginning with what you will do **first, second, third,** and so on. Also list the name of the group member who will be responsible for doing each step:

Create a timeline stating dates of completion for the steps listed above:

Describe the end result of your efforts. What exactly will you have accomplished?

Individual Commitment

On the following form, state the responsibilities you took on as part of your personal contribution toward solving a global problem.

Youth Summit Statement of Individual Commitment to Work on an Area of Global Concern

Name: ____

Area of Global Concern:

List the commitments you made to your group at the Summit:

Please describe below any additional commitments you would like to make and pursue independently:

Signature: ______________________________ Date: ______

Thank you for your efforts to make the world a better place!

STEP 7—Presenting Solutions

GOAL: To develop presentations that inform others about the issue and the plan of action.

OBJECTIVES:

- Suggest various ways to present information and solutions.
- Teach at least 10 facts to the audience.
- Actively engage the audience in learning about the issue and in taking action.

TIME: 1 - 3 hours.

PROCESS: Allow time for students to present information about the problem and their solutions to the class. Students might use some of the products from the Scavenger Hunt or Independent Research to teach others about the problem. Encourage the use of charts, diagrams and illustrations. Poetry, songs, raps, or skits can also be a great way to inform others. Emphasize the need to develop dynamic and interesting presentations that encourage audience participation.

To help the students prepare a presentation, the following three steps are included in their Summit Journals:

Step 1: Determine how you will inform the audience about your group's specific problem. What will you say or do to begin your presentation and how will you explain the issue you have addressed?

Step 2: Outline below how you plan to describe your solution and action plan to the audience. Select at least two of the strategies listed below to include in your presentation.

Presentation Stategies:

- charts, graphs, tables
- posters
- illustrations, photographs
- cartoons
- poems, songs, raps
- skits, plays, simulations
- data sheets
- booklets, pamphlets, handouts
- overhead transparencies
- slides, video, music
- audience participation

Outline of your solution and action plan:

Step 3: If appropriate, how can your group engage the support of the audience in implementing your solution? List ways that your group could involve community members, business and industry, local schools, parents, and organizations that might give support. Prepare to share this as part of your presentation.

After the students have prepared their presentations, they may want to go "on the road" with them. Exhibits can be set up in the school or public library so other students can see them. Talk to your principal about holding a school-wide assembly. There may be other students who want to get involved in the activities. A Parent Night or Community Night could be set up to inform others, not only about the issues, but also about what students have been doing to resolve them.

In Conclusion:

The actual implementation of solutions may be a year long, or longer, process for some of your students. You may find that your class will be involved throughout the school year. You may wonder how you could possibly take any more classroom time for this issue. However, many of the activities can be integrated with other areas. For example, writing will undoubtedly be an activity that all groups will participate in. Public speaking can also be incorporated into the solution-finding process. Students may get involved with state lawmakers and learn about the legislative process or they may conduct scientific research through local zoos, water protection agencies, or universities. Posters and art work might be developed as a visual means of communicating information. Likewise, students may want to write a song, perform a play or choreograph a dance relating to their topic. They may also wish to survey pertinent people or obtain feedback on their proposed solutions.

The possibilities for integrating this material into all content areas are limitless. But more importantly, we have found that through this "real life" content and the process of problem-solving and actually implementing solutions, students become highly motivated toward learning in general. In addition, students are more creative and willing to take risks. Even the unmotivated learner begins to shine as he/she is able to independently take responsibility for learning. Parents report that their children have begun reading newspapers and watching educational television. Students become more involved in school, in the community, and in the world. And most importantly, they recognize their place as caretakers of one another and of the planet.

It is imperative that the next generation have the skill and ability to effectively deal with the global challenges that will face them. The purpose of this series is to instill in students an awareness of the importance of taking action that will have a long-term, beneficial effect on the entire planet. As problems become more and more common, it is hoped that the next generation will have the sensitivity, the skills, and the desire to solve them. Our future, and our children's future, truly depend on what happens today.

Our Only Earth

SUMMIT JOURNAL

The Ocean Crisis

Introduction

A creative problem-solving process will be used to structure your efforts towards finding and then implementing solutions to your global challenge. This process provides a way to capture your dreams and hopes by putting them in a practical form that enables you to make positive contributions to your community and the world community, today and in the future.

STEP 1—Problem Exploration

Reflect for a moment on the many things you have learned about your global issue. Also reflect on how that information made you feel. Did you feel frightened or overwhelmed from the scope of the problem? Do you have concern for the well-being of others? In the space provided below, write down your feelings and thoughts about this issue. Include images, ideas, fears, or anything else associated with the problem.

In small groups, discuss your feelings and thoughts surrounding this issue. Note how your feelings are similar to, or different from, other members' in the group. Be prepared to summarize your group discussion for the benefit of the whole class. Choose a spokesperson.

Record the key ideas of your group on the back of this page or on a new sheet of paper. During the discussion, add any new bits of information to your list.

STEP 2—Sharing Research

Each group member will be asked to describe to the others his/her independent research project. Use the Data Retrieval Chart (see sample below) to categorize the information you have learned as a result of the presentations. Each member's name should be listed in the Name column, and then for each person the **who, what, when, where** and **why** facts from their work. Also keep records of any new questions that come up. Discuss ways to find the answers and assign responsibilities. Choose a new spokesperson to present your Data Retrieval Chart to the entire class.

DATA RETRIEVAL CHART

Name	Who	What	When	Where	Why

STEP 3—Brainstorming Problems

Step 3 has two aspects: the first is to identify the many problems associated with your issue and the second is to define the specific problem which your group decides to address. By identifying the problems surrounding the issue, the proper definition can be determined, which influences the quality and appropriateness of your solutions.

In your group, brainstorm the problems related to your global issue. List your ideas below.

Now go back and review your list. What problems go together? Cross out any problems that are repeated. Add new ones that may come up as you review the list. As a group, decide which problem to solve.

BRAINSTORMING PROBLEMS (con't)

Problem Definition

One of the ways to clarify a problem is to phrase it as a question. Restating your problem as a question will make it clear and definite. This will also direct you to possible solutions. For example, if your issue is the disposal of waste products in your city, several questions could be formulated, such as:

- How can we educate our community about its waste disposal problem?
- In what ways could we reduce the amount of waste our community generates?
- How can we limit the amount of disposable products used in our community?
- What kind of recycling program could we create locally?

There could be many other questions as well. As you can see by restating your problem as a question, the focus becomes more clear and you may be better prepared to seek answers. These answers will later suggest solutions which will lead you to a specific group project. For now, however, the task is to take your issue and turn it into a question. On the space provided below, write your group's issue:

Working individually, take a couple of minutes to come up with two or three possible questions. You will want to include a strong action-oriented word in each of your questions such as any of the following:

educate
limit
decrease
reduce
inform
involve
enhance
promote
publicize

Write two or three questions that restate your issue on the following lines. Choose one of the action words above, or better yet, generate some of your own for each question you create. Circle the strong action word in each question:

1. ____

2. ____

3. ____

Next, share the questions with your group. Choose one which is most fitting and write it below:

Problem Question: ____

Before beginning STEP 4 — Brainstorming Solutions, review the information you have gathered. Determine what new information you might need in order to solve this particular problem.

STEP 4—Brainstorming Solutions

List the solutions generated by your group discussion in the space below:

STEP 5—Evaluating Solutions

In this step, you decide which solutions might be most appropriate for solving the problem. To evaluate your solutions use the EVALUATION PROCESS FORM located on the next page. Decide on the top two solutions. Once you have used the EVALUATION GRID to determine your best solutions, discuss your results with the group to make sure that everyone agrees that this is the best solution.

Youth Summit Solution Evaluation Process

SOLUTIONS: Rank in order your top 2 solutions and list	**POSITIVE OUTCOMES +** List 3 positive outcomes for each solution	**NEGATIVE OUTCOMES -** List 3 negative outcomes for each solution	**POSSIBLE SHORT- & LONG-TERM CONSEQUENCES:** List the consequences that might result from the implementation of your solutions in a 1-, 5-, 10-, and 20-year time frame. Put a + or - by each consequence to signify whether it is positive or negative.			
SOLUTION #1:			**1 YEAR**	**5 YEARS**	**10 YEARS**	**20 YEARS**
SOLUTION #2:						

GROUP TOPIC:

GROUP MEMBERS:

SPECIFIC GROUP CHALLENGE:

Modifying Solutions

Once your group has determined the best solution to your issue, some modifications may be necessary. You may need to adjust your solution so that potential negative outcomes can be limited. To decide if you need to adjust your solution, answer the following questions:

1. What were some negative outcomes that could result from implementing your solution?

2. How could you avoid these negative possibilities?

3. Were there any possible negative short or long term consequences? If so, list these below.

4. Based upon the information to the above questions, how could you adjust your solution to minimize potential negative outcomes or consequences?

5. Write out your modified solution in the space provided below:

Congratulations! You should now have a well thought out solution to your group's selected problem.

STEP 6—Action Planning

You will now need to organize how to carry out your group's solution. Each of you will have individual tasks to complete. On the form below, write down your group action plan.

Youth Summit Group Action Plan Form

Group Topic:____

Group Members: (Please list first and last names.)

Describe the specific problem your group decided to solve:

List your best solution:

List the specific steps your group will take to carry out the solution, beginning with what you will do **first, second, third,** and so on. Also list the name of the group member who will be responsible for doing each step:

Create a timeline stating dates of completion for the steps listed above:

Describe the end result of your efforts. What exactly will you have accomplished?

Individual Commitment

On the following form, state the responsibilities you took on as part of your personal contribution toward solving a global problem.

Youth Summit Statement of Individual Commitment to Work on an Area of Global Concern

Name: ______________________________

Area of Global Concern:

List the commitments you made to your group at the Summit:

Please describe below any additional commitments you would like to make and pursue independently:

Signature: ______________________________ Date: ________

Thank you for your efforts to make the world a better place!

STEP 7—Presenting Group Solutions

Now that your group has determined a solution and an action plan, the next step in the Youth Summit process is to develop a presentation to inform others of your efforts. Your group should create a 5- to 15-minute presentation. To help organize your ideas, follow the steps below:

Step 1: Determine how you will inform the audience about your group's specific problem. What will you say or do to begin your presentation and how will you explain the issue?

Step 2: Outline below how you plan to describe your solution and action plan to the audience. Select at least two of the strategies listed below to include in your presentation.

Presentation Strategies:

- charts, graphs, tables
- posters
- illustrations, photographs
- cartoons
- poems, songs, raps
- skits, plays, simulations
- data sheets
- booklets, pamphlets, handouts
- overhead transparencies
- slides, video, music
- audience participation

Outline of your solution and the action plan portion of your presentation:

Step 3: If appropriate, how can your group engage the support of the audience in implementing your solution? List ways that your group could involve community members, business and industry, local schools, parents, and organizations who might give support. Prepare to share this as part of your presentation.

Summit Notes

Use this space to record information presented by the other groups. Be ready to write down what you can do to help solve the various problems presented.

Glossary

acid rain: the product of sulphur and nitrogen oxides in the atmosphere, from electrical power plants, industry, and auto emissions. These chemicals are transformed into acids and fall back to Earth as rain, sleet and snow.

algae: primitive, one-celled or multi-celled plants, usually living in water and having no roots or stems.

byproducts: something left over from the production of something else, a secondary product.

chlorine: a poisonous gas.

contaminate: to make impure or unuseable.

corrosion: the process of dissolving or wearing away of metals.

crustacean: a group of sea animals including lobsters, crabs, shrimp, and barnacles.

deforestation: the process of clearing forests through cutting or burning.

desalination: the process of removing salt.

dioxins: a group of poisonous chemicals.

ecology: the study of the relationship between organisms and their environment.

ecosystem: a community of living species and their environment that function as an ecological unit in nature.

endangered: in danger, imperiled, threatened.

extinct: the permanent loss of a species of plant or animal.

fertilizer: manmade chemicals used to improve the growth of plants.

fungicide: manmade chemicals sprayed on farm crops to kill fungi growth.

geothermal: using the internal heat of the earth.

habitat: the area or type of environment in which a plant or animal lives.

heavy metals: naturally occuring elements such as lead and mercury which can be hazardous when disposed of in concentrated amounts.

herbicide: manmade chemicals sprayed on farm crops to kill weeds.

incineration: the burning of dangerous, lethal chemicals at sea in special incinerator ships.

insecticide: a manmade chemical sprayed on farm crops to kill unwanted insects.

marine: having to do with the sea or oceans.

offshore drilling: the building and use of large scale commercial oil wells in coastal waters.

oil spill: the accidental or deliberate dumping of either crude oil or refined oil into the oceans which can spread over vast areas.

organic: having to do with living organisms; organic farming is a method of farming where no artificial chemicals are put on crops.

PCBs (polychlorinated biphenols): highly toxic industrial byproducts which are often burned at sea and then dumped into sea waters.

pesticides: manmade chemicals sprayed on farm crops to kill many types of pests, usually insects or rodents.

pollutant: anything that pollutes; especially gaseous or chemical waste.

pollution: the contaminating of soil, water, or air by the discharge of toxic substances.

radioactivity: the sudden emission of possibly dangerous radiation from unstable atomic substances.

recycle: to reuse; to extract useful materials from garbage or waste and find a new use for them.

red tide: the sudden turning of sea water, usually close to shore, to reddish or brownish colors from massive growths of algae and other toxic micro-organisms.

renewable: able to be used again.

resources: an available supply of something that can be used.

runoff: the running of industrial waste, garbage, farm chemicals, or topsoil from the land into drains, streams and rivers, and then into coastal waters.

sediment: material that settles to the bottom in water; usually referring to topsoil or fine dirt.

sedimentation: the deposit of large amounts of sediment; usually at the mouths of rivers.

seepage: material that seeps or oozes.

shellfish: any marine animal having a shell (crustaceans are shellfish).

sludge: mud or slushy mire often coming from the treatment of sewage.

solar radiation: radioactive energy coming from the sun.

solvent: a liquid used to dissolve another substance; often a strong chemical used for cleaning.

toxic: harmful, poisonous, deadly, destructive.

References

THE OCEAN CRISIS

BOOKS:

Borgese, Elisabeth Mann. *The Future of the Oceans.* Montreal: Harvest House, 1986.

Brown, Lester et al. *State of the World 1989. A Worldwatch Institute Report on Progress Toward a Sustainable Society.* New York: Norton & Co., 1989.

Coltharpe, Barbara Anne. *Mr. Rumples Recycles.* Baton Rouge, LA: Hyacinth House Publishers, 1989.

Corson, Walter, ed. *Citizen's Guide to Global Issues.* Washington, DC: Global Coalition Tomorrow, 1985.

Davidson and Schniedewind. *Cooperative Learning, Cooperative Lives.* Dubuque, IA: William C. Brown, Co., 1987.

Diffenderfer, Susan. *The Study of Ecology: Learning to Love Our Planet.* Tucson, AZ: Zephyr Press, 1984.

Hynes, H. Patricia. *Earth Right.* Rocklin, CA: Prima Publishing, 1990.

Kidder, Rushworth M. *An Agenda for the 21st Century.* Cambridge, MA: The MIT Press, 1987.

MacEnchern, Diane. *Save Our Planet.* New York: Dell Publishing Company, 1990.

Maurer, Richard and WGBH Educational Foundation. *Junk in Space.* New York: Simon and Schuster, Inc., 1989.

Middleton, Nick. *Atlas of Environmental Issues.* Facts on File, Inc., 1989.

Myers, Dr. Norman, ed. *GAIA: An Atlas of Planet Management.* Garden City: Anchor Books, 1984.

Poppel, George. *The Planet of Trash.* Bethesda, MD: National Press, Inc., 1987.

Whitfield, Dr. Philip. *Can the Whales Be Saved?* New York: Viking Penguin, Inc., 1989.

ARTICLES & PAMPHLETS:

"Ban on 'Walls of Death' Gaining (Drift Net Fishing)." *Christian Science Monitor*, 21 July 1989, 6.

Greenpeace. "Backgrounder on Ocean Incineration." Greenpeace, 1989.

Hayes, Dennis. "Pollution: The Neglected Dimensions." *Worldwatch Paper #27.* Washington, DC: Worldwatch Institute, March 1979.

"Help Prevent Dioxin Poisoning." *Greenpeace Toxics.* 1989.

"High Seas Driftnets." *Greenpeace Pacific Campaign.* Fall 1989.

la Riviere, Maurits J.W. "Threats to the World's Water." *Scientific American,* September 1989.

"Most US Coastal Waters Are Found to be Polluted." *The Boston Globe,* 10 August 1989, 6.

"Municipal Solid Waste Incinerators." *Greenpeace Action.* 1989.

"Offshore Oil Drilling." *Greenpeace Ocean Ecology.* 1989.

"Protecting Our Estuaries." *EPA Journal,* July/August 1987.

Sancton, Thomas A. "What on EARTH Are We Doing." *Time,* 2 January 1989.

"Scouring Coastlines, They Find Tons of Trash." *Philadelphia Inquirer,* 3 July 1989, 3A.

Toms, Michael with F. David Peat. "The Physics of Gentle Action." *New Dimensions,* November/December 1989.

Toufexis, Anastasia. "The Dirty Seas." *Time,* 1 August 1988.

"Toward A Chlorine-free Pulp and Paper Industry." *Greenpeace Toxics.* 1989.

"Tuna Fishing Threatens Dolphins." *Greenpeace Ocean Ecology,* Fall 1989.

United States Environmental Protection Agency. *Earth Trek . . . Explore Your Environment.* Washington, D.C.: Office of Public Affairs, April 1987.

OTHER RESOURCES:

Kids Against Pollution: An organization of 5th and 6th graders involved in a bimonthly letter writing campaign about pollution.
K.A.P.
Tenakill School
275 High Street
Closter, NJ 07624

Educating for a Global Future: a special double issue of *Breakthrough,* the publication of Global Education Associates.
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Youth Ambassador - Dept. B
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Linda MacRae-Campbell taught grades K-12 for fifteen years, and during that time was a three-time winner of the Teacher of the Year Award.

Her accomplishments include directing gifted, special ed., and arts programs for children; consulting for a variety of educational institutions; training teachers world wide and directing an international educational network in Seattle called New Horizons for Learning.

Linda is a nationally recognized expert in innovative educational research; she has given over one hundred presentations in the last three years.

Presently, she is persuing a doctorate in education, and coordinating a new model of teacher certification for Antioch University in Seattle, Washington.

—*—

Micki McKisson has been a classroom teacher, and an educational consultant for many years, a workshop facilitator and adjunct professor for Seattle Pacific University.

Micki has experience in coordinating and teaching a variety of educational programs involving U.S. and Brazilian students in Rio de Janeiro; working with youth at risk during five years of summer programs; and, for six years, teaching in the Gifted Education Program in Issaquah school district.

Currently, Micki works with Greenpeace International as North American Project Coordinator for the East/West Educational Project.

Micki has a BA in Psychology and an MA in Systems Design—Education. Her previous book is titled *Chrysalis: Nurturing Creative and Independent Thought in Children.*

—*—

Together, Linda and Micki have developed and conducted the world's first Youth Summit in Moscow, where 200 Soviet and American youths worked together writing the Youth Declaration for the Future. They have also collaborated on teacher education programs for educators in Guatemala.

—*—

Bruce Campbell has worked extensively in the field of education since 1967. His experience includes being a peace corps volunteer, a classroom teacher, a director of two private schools, a curriculum specialist, consultant, and an adjunct professor.

As a teacher trainer, he teaches courses in the multiple intelligences, multicultural arts, curriculum development, learning styles, kinesthetic learning, and environmental issues. Bruce conducts youth summits in Washington and California.

As a classroom teacher, he is currently teaching third grade students in the Marysville School District in Washington State and he also conducts research on interdisciplinary curriculum and learning through the seven multiple intelligences.

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